11-6625-680-15-1

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DS, GS, AND
DEPOT MAINTENANCE MANUAL

TEST SET, MOTOR-GENERATOR AN/GSM-65 (RAM METER INC. TYPE L-1A)

This copy is a reprint which includes current pages from Changes 1 and 2.

HEADQUARTERS, DEPARTMENT OF THE ARMY
JANUARY 1970

D 101.11!

READEX FICHE best copy available

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

During testing operations, 115 volts ac is present. Serious injury or death may result from contact with internal connections at switches and transformers.

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *9 April 1975*

Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual

TEST SET, MOTOR-GENERATOR AN/GSM-65 (RAM METER INC. TYPE L-1A)

TM 11-6625-680-15-1, 12 January 1970, is changed as follows:

1. A vertical bar appears opposite changed material.
2. Remove and insert pages as indicated below:

Remove	*Insert*
None	Warning notice inside front cover

3. File this change sheet in front of the manual for reference purposes.

By Order of the Secretary of the Army:

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General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-26, (qty rqr block No. 482, 485, 488), Operator maintenance requirements for PU-543/A, PU-544/A, PU-545/A.

Change No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *30 October 1973*

Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual TEST SET, MOTOR-GENERATOR AN/GSM-65 (RAM METER INC. TYPE L-1A)

TM 11-6625-680-15-1, 12 January 1970, is changed as follows:

1. A vertical bar appears opposite changed material.
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Remove pages	*Insert pages*
i and 1-0	i
None	1-0
1 and 2	1
21 through 24	None

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CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

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VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-36, direct and general support maintenance requirements for PU-543/A, PU-544/A and PU-545/A.

WARNING

After the dc power source is connected to the 28 vdc input terminals on the front panel of the test set, bind the input dc terminals with electrical insulation tape (NSN 5970-00-296-1625), leaving no bare metal of the binding posts or conductor exposed. Failure to observe this warning can result in severe burns to personnel.

Technical Manual
No. 11-6625-680-15-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *12 January 1970*

Operator's, Organizational, DS, GS, and Depot Maintenance
MANUAL TEST SET, MOTOR-GENERATOR AN/GSM-65

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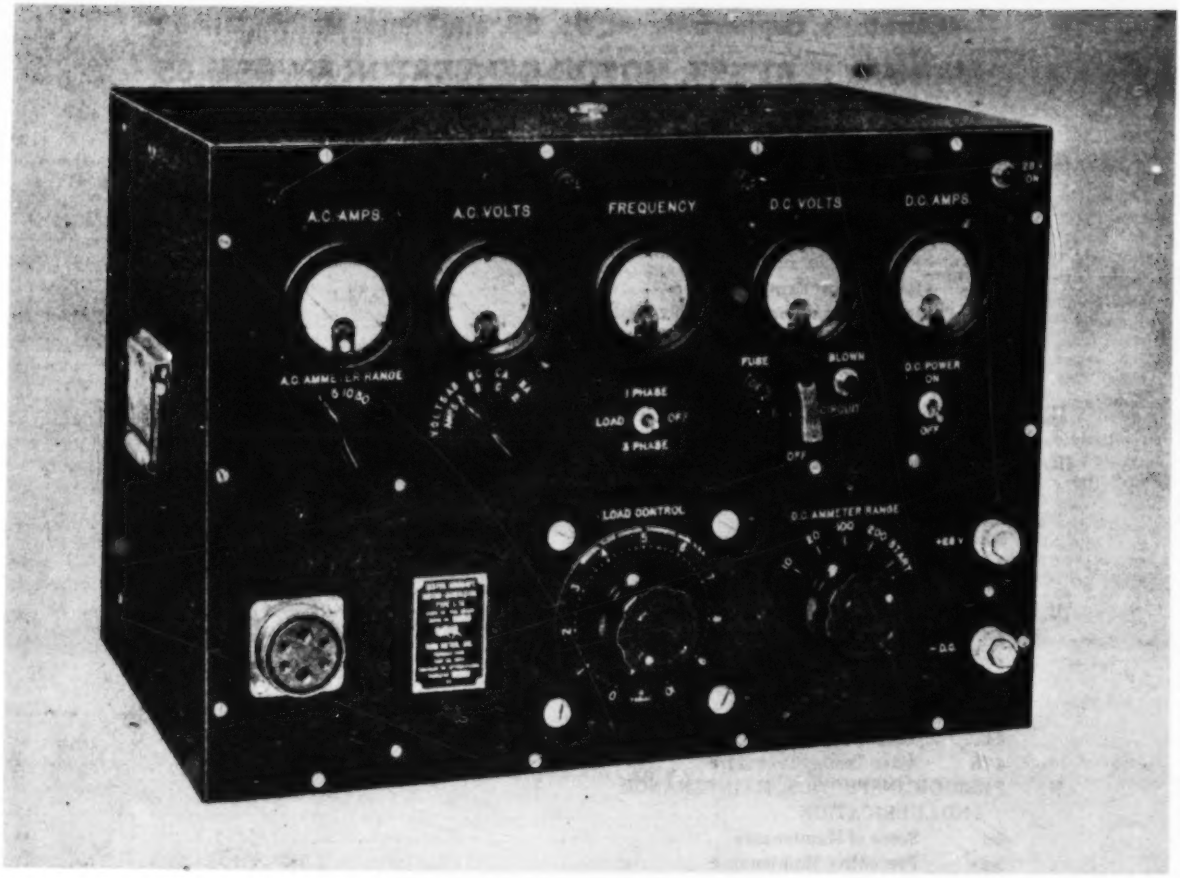


Figure 1-1. Test Set, Motor-Generator AN/GSM-65 (RAM METER INC. TYPE L-1A).

SECTION I
INTRODUCTION AND DESCRIPTION

1-1. General

1-2. Scope

This manual describes Test Set, Motor-Generator AN/GSM-65 (RAM METER INC. TYPE L-1A, fig. 1-1) and provides instruction for installation operation, maintenance, troubleshooting, and calibration of the equipment. It includes the basic issue items list (Appx B) and Maintenance allocation charts (Appx C). All references to Motor-Generator Tester, Type L-1A in this manual apply to Test Set, Motor-Generator AN/GSM-65 (RAM METER INC. L-1A) procured on contract DAAB05-68-C-0954.

NOTE

Appendix C is current as of 10 September 1969.

1-2.1. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-2.2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP PUB 378 (Navy)/AFR 71-4 (Air Force)/and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP PUB 459 (Navy)/AFM 75-34 (Air Force)/and MCO P4610.19 (Marine Corps).

1-2.3. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-C, Fort Monmouth, NJ 07703.

1-2.4. Items Comprising an Operable Equipment

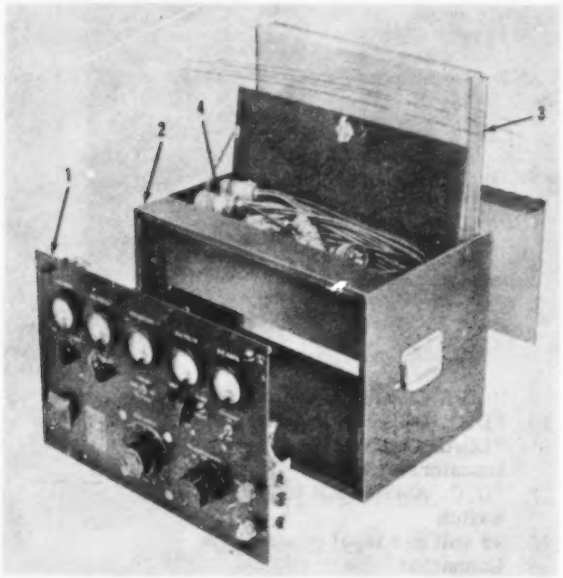
Test Set, Motor-Generator AN/GSM-65 is illustrated in figures 1-1 and 1-2.

FSN	*QTY*	*Nomenclature*
4920-348-5793		Test Set, Motor-Generator AN/GSM-65 consisting of:
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.
4920-134-4831	1	Test Set, Motor-Generator TS-2888/GSM-65: test inverter output voltage, current, and frequency; 282 DC operating power requirement; overall dim 24-1/8 in. lg, 16-1/4 in. w, 17-1/8 in. h; 154-02, 06833
4920-437-2468	1	Cable Assembly, Power, Electrical CX-12082/GSM-65
4920-437-2443	1	Cable Assembly, Power, Electrical CX-12083/GSM-65
4920-437-2442	1	Cable Assembly, Power, Electrical CX-12084/GSM-65
4920-437-2444	1	Cable Assembly, Power, Electrical CX-12085/GSM-65
4920-437-2446	1	Cable Assembly, Power, Electrical CX-12086/GSM-65
4920-437-2448	1	Cable Assembly, Power, Electrical CX-12087/GSM-65
4920-437-2461	1	Cable Assembly, Power, Electrical CX-12088/GSM-65
4920-437-2467	1	Cable Assembly, Power, Electrical CX-12089/GSM-65

1-3. This equipment is used to test aircraft inverters up to a maximum output of 2500 volt-amperes at unity power factor. Testing is accomplished by metering the input voltage and current, and the output voltage, current, and frequency of the inverter under test.

1-4. DESCRIPTION. (See figure 1-2.)

1-5. The tester consists of panel assembly (1), mounted in cabinet assembly (2); load bank (3), mounted in the rear of the cabinet; and seven cable set assemblies (4), stored in a compartment in the top of the cabinet.



1. Panel assembly
2. Cabinet assembly
3. Load bank
4. Cable set assemblies

Figure 1-2. Major Components

1-6. Mounted in the tester panel are a-c ammeter (1, figure 1-3), a-c voltmeter (2), frequency meter (3), d-c voltmeter (4), and d-c ammeter (5). The a-c ammeter, a-c voltmeter, frequency meter, and the d-c voltmeter are protected by fuses. In addition, the d-c ammeter is protected by a sensitive-type relay so connected in the circuit that an overload on the meter of from 10 to 30% will operate the sensitive relay and open the direct current power input by means of a special interlock type circuit.

1-7. The controls consist of the following: "A.C. AMMETER RANGE" switch (6), "VOLTS/AMPS" switch (7), "LOAD" switch (8), "LIVE CIRCUIT" switch (9), "D.C. POWER" switch (10), "LOAD CONTROL" autotransformer knob (11), and "D.C. AMMETER RANGE" switch (12).

1-8. 28 volt d-c input connections (13) are provided at the lower right side of the tester panel. Input to the inverter to be tested is through connector (14) and one of the cable sets. A green pilot light (15) indicates when the "D.C. POWER" switch is on.

1-9. POWER REQUIREMENTS.

1-10. A 5 KW volt source of d-c power is required to test all inverters up to a maximum output of 2500 volt-amperes.

1-11. PRINCIPLES OF OPERATION.

1-12. The tester is designed so that any inverter, whether single-phase or three-phase delta output, may be plugged into it by means of a suitable cable set. D-C voltage is fed into the input section of the inverter to activate it. The output of the inverter is fed back into the tester through the same cable set Input voltage and current are checked by reading the d-c voltmeter and the d-c ammeter.

1-13. Output voltage, frequency, and current are indicated by the a-c voltmeter, frequency meter, and a-c ammeter respectively.

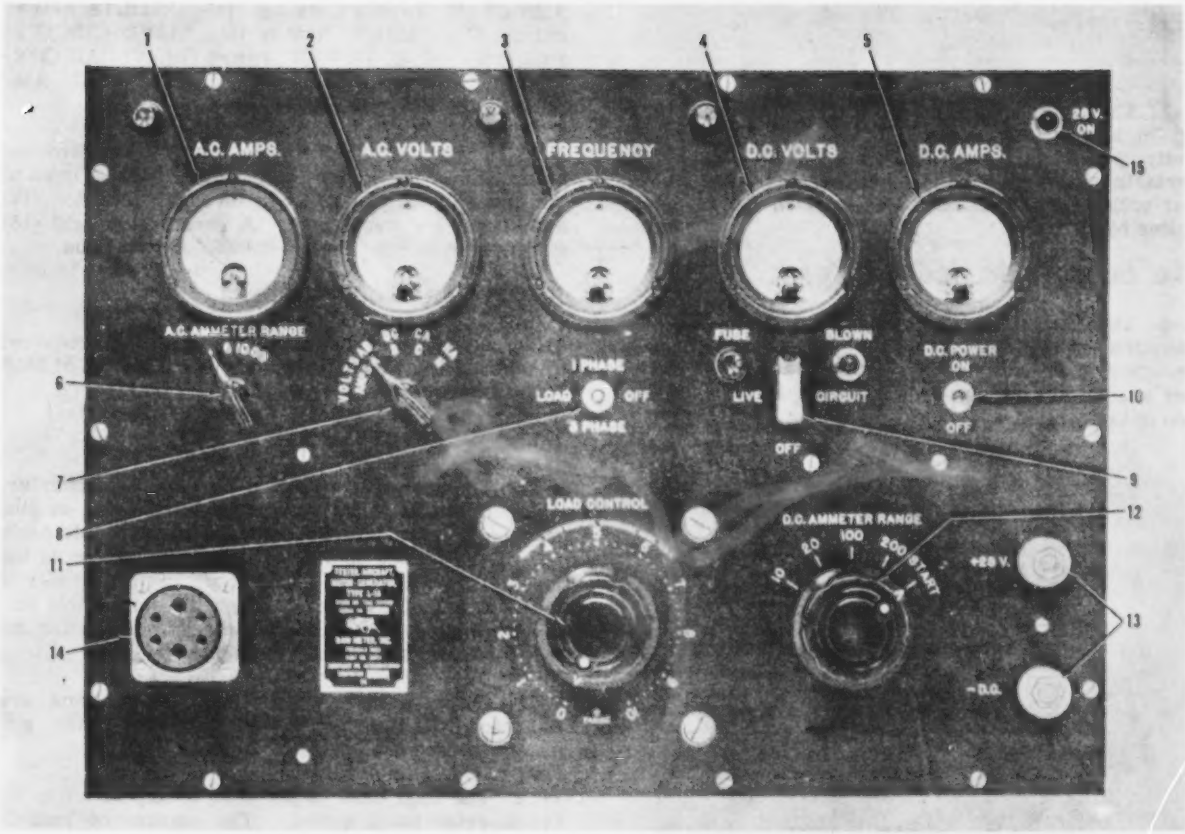
1-14. The load bank is provided to impose a load on the inverter being tested. The amount of load is controlled by the "LOAD CONTROL" knob.

1-15. A "live circuit" is provided to supply current to the filament and cathode heaters of electronic tubes used in the control circuits of some inverters. The live circuit is also used to supply power to the control terminals of inverters which use the 4- or 5-post AN-type terminal block.

1-16. Connection of the live circuit is made automatically by means of the cable set and is connected to the power side of the special interlock circuit so that the tubes may be heated before the "D.C. POWER" switch is thrown, thereby protecting the inverter at all times.

1-17. The various switches are provided to permit testing the different circuits of inverters at the proper values.

1-18. A schematic wiring diagram of the tester is provided in figure 1-4.



1. A-C ammeter
2. A-C voltmeter
3. Frequency meter
4. D-C voltmeter
5. D-C ammeter
6. "A.C. AMMETER RANGE" switch
7. "VOLTS/AMPS" switch
8. "LOAD" switch
9. "LIVE CIRCUIT" switch
10. "D.C. POWER" switch
11. "LOAD CONTROL" auto-transformer switch
12. "D.C. AMMETER RANGE" switch
13. 28 volt d-c input connections
14. Connector
15. Pilot light

Figure 1-3. Panel Assembly and Controls

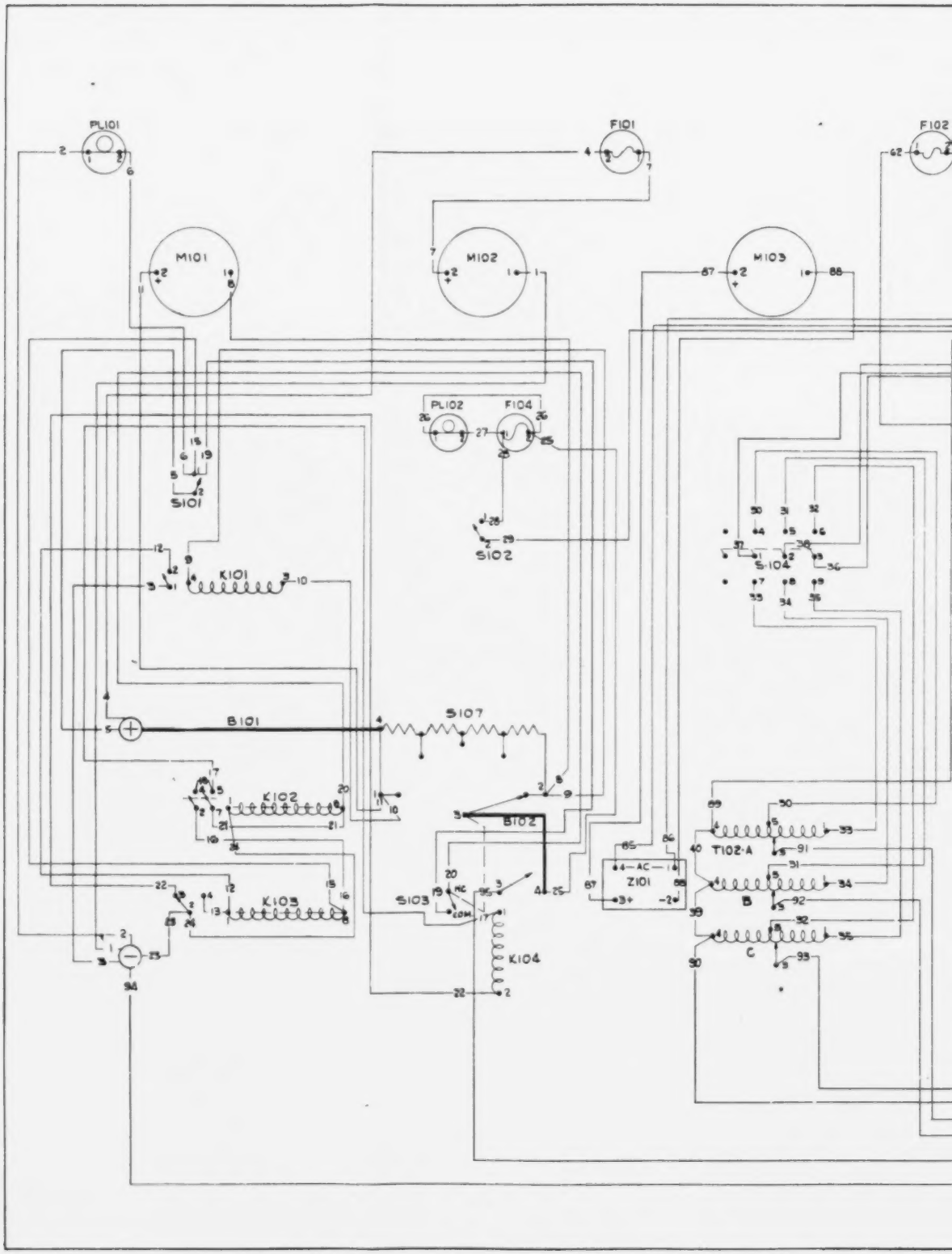
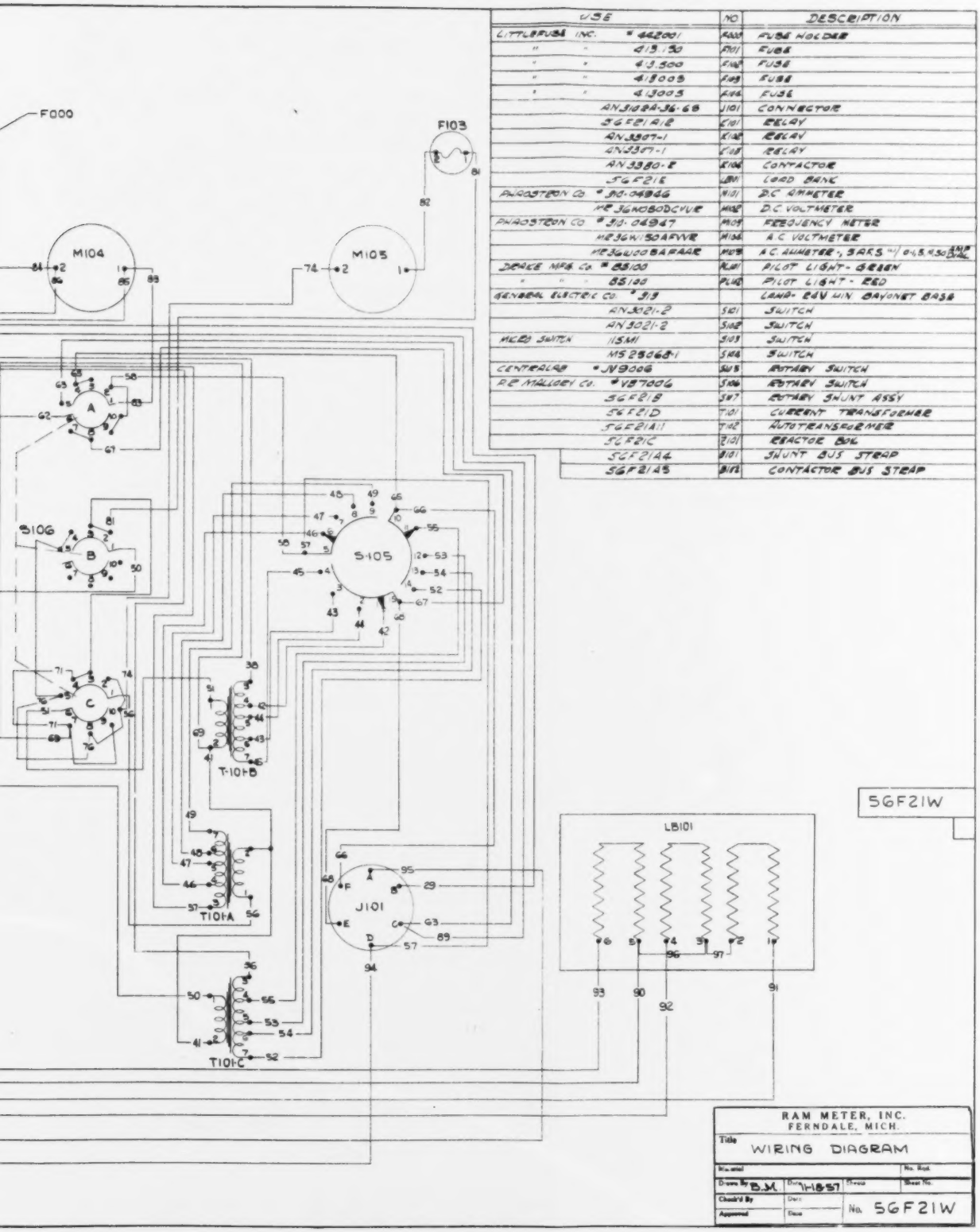


Figure 1-4. Schematic Wiring Diagram



USE	NO	DESCRIPTION
LITTLEFUSE INC. * 442001	FH101	FUSE HOLDER
" " 419.150	F101	FUSE
" " 413.500	F102	FUSE
" " 413003	F103	FUSE
" " 413003	F104	FUSE
AN3108A-36-6S	J101	CONNECTOR
5GF21A12	K101	RELAY
AN3307-1	K102	RELAY
AN3347-1	K103	RELAY
AN3380-2	K104	CONTACTOR
5GF21E	LB101	LOAD BANK
PHAOSTRON CO. * 30-04946	M101	D.C. AMMETER
MP36NO80DCVUR	M102	D.C. VOLTMETER
PHAOSTRON CO. * 30-04947	M103	FREQUENCY METER
MP36W150AFWR	M104	A.C. VOLTMETER
MP36W100BAPAAR	M105	A.C. AMMETER, 3 AMPS. W/ 0-1.5, 1.5-3.0 AND 3 DIAL
DRAKE MFG. Co. * 88100	PL101	PILOT LIGHT - GREEN
" " " 88100	PL102	PILOT LIGHT - RED
GENERAL ELECTRIC CO. * 313		LAMP - 24V MIN. BAYONET BASE
AN3021-2	S101	SWITCH
AN3021-2	S102	SWITCH
MICRO SWITCH 11SM1	S103	SWITCH
MS25068-1	S104	SWITCH
CENTRALAB * JV9006	S105	ROTARY SWITCH
P.R. MALLORY CO. * V37006	S106	ROTARY SWITCH
5GF21B	SH7	ROTARY SHUNT ASSY
5GF21D	T101	CURRENT TRANSFORMER
5GF21A11	T102	AUTOTRANSFORMER
5GF21C	Z101	REACTOR BOX
5GF21A4	B101	SHUNT BUS STRAP
5GF21A5	B102	CONTACTOR BUS STRAP

RAM METER, INC. FERNDALE, MICH.	
Title: WIRING DIAGRAM	
Drawn By: B.M. Date: 11-18-57	No. 5GF21W

SECTION II

SPECIAL SERVICE TOOLS

2-1. No special service tools are required to service or maintain the tester. Only ordinary tools, normally used by electricians, are needed.

SECTION III

PREPARATION FOR USE, STORAGE, OR SHIPMENT

3-1. PREPARATION FOR USE.
a. Carefully remove the equipment from the shipping crate and packing carton.
b. Discard the protective material in the cable set storage compartment.

3-2. CONNECTIONS.
a. Connect the d-c power source to the 28 volt d-c input terminals, being careful to observe polarity as marked. The d-c voltmeter should indicate about 28 volts.

3-3. PREPARATION FOR STORAGE.

3-4. No special precautions need be taken to store the equipment. Provide an adequate cover to exclude dirt.

3-5. PREPARATION FOR SHIPMENT.
a. Make provisions to protect the connectors of the cable sets from damage.
b. Carefully crate the equipment according to standard procedure for commercial shipment.

SECTION IV

OPERATION INSTRUCTIONS

4-1. PRELIMINARY ADJUSTMENTS.

4-2. Check mechanical zero of each meter and adjust if necessary.

NOTE

The frequency meter should be mechanically zero-set at the 400 cycle mark.

4-3. USE OF CABLE SETS.

4-4. The inverter to be tested is connected to the tester by means of one of the eight cable sets provided. It is necessary, first, to determine whether the unit is a single-phase or a three-phase inverter. Three-phase inverters can be tested on delta output only. Then select the proper cable set by matching the number and type of terminals of the cable set to those of the inverter.

NOTE

Cable sets are easily identified by numbered strips encircling the cables near the large connector.

4-5. The following is a partial list of inverters currently in use and the cable sets required to test them.

INVERTER NUMBER	RATED OUTPUT	CABLE ASSEMBLY NUMBER
AN3534-1	750 VA 3Ø Delta 115 V	2
F16-4	250 VA 3Ø Delta 115 V	2
F20-4	500 VA 3Ø Delta 115 V	2
MS25094	500 VA 3Ø Delta 115 V	5
MS25095	750 VA 3Ø Delta 115 V	5
MS25096	1500 VA 3Ø Delta 115 V	7
MS25097	2500 VA 3Ø Delta 115 V	7
MS25161	1500 VA 1Ø 115 V	4
MS25162	2500 VA 1Ø 115 V	4
MS25173	250 VA 3Ø Delta 115 V	2
MS25173	250 VA 1Ø 115 V	3
MS25174	500 VA 3Ø Delta 115 V	2
MS25174	500 VA 1Ø 115 V	3
MS25175	750 VA 3Ø Delta 115 V	2
MS25175	750 VA 1Ø 115 V	3
PU16	750 VA 1Ø 115 V	3
3011-1EICOR	100 VA 3Ø Delta 115 V	1
32E03-3-E	2500 VA 1Ø 115 V	4
PU-542/A	100VA 3Ø 115V	1
	60VA 1Ø 115V	1
PU-543/A	250VA 1Ø Delta 115V	8
PU-544/A	750VA 1Ø 115 V	5
	750VA 3Ø Delta 115V	5
PU-545/A	2500VA 1Ø 115 V	7
	2500VA 3Ø Delta 115V	7

4-6. CONNECTING INVERTER TO TESTER.
a. Having selected the proper cable set, make the necessary connections at the inverter.

NOTE

On three-phase inverters, input connections must be wired for delta output only.

b. Make sure that all toggle switches are in their "OFF" positions.
c. Plug the large connector of the cable set into the connector in the panel.

4-7. OPERATION INSTRUCTIONS.
a. With all toggle switches in their "OFF" positions, set the "D.C. AMMETER RANGE" switch in the "START" position.

NOTE

The tester is designed so that an overload of 10 to 30% imposed on the d-c ammeter will automatically shut off the d-c power and shut down the tester. In that event, it will be necessary to go through the whole starting procedure again, resetting the power switch to the "OFF" position and the "D.C. AMMETER RANGE" switch to the "START" position.

b. Set the "A.C. AMMETER RANGE" switch in the 50 amp position for safest operation.
c. Turn the "LOAD CONTROL" knob to zero.

4-8. TESTING PROCEDURE.

NOTE

All tests should be conducted making constant reference to the publication pertaining to the specific inverter being tested. It is imperative that all control switches be set correctly in accordance with the instructions contained in this handbook and with the instructions contained in the applicable inverter handbook.

4-9. Before turning the "D.C. POWER" switch on, check to be sure the inverter does not incorporate an internal power relay or tubes requiring an external "live circuit." If it does, refer to the applicable publication and turn on the "D.C. POWER" switch and the "LIVE CIRCUIT" switch in the order prescribed and follow instructions regarding warm-up, etc., implicitly.

4-10. Otherwise, turn on the "D.C. POWER" switch. The green indicating pilot light should turn on and the inverter should start immediately.

4-11. Check the a-c voltmeter and the frequency meter for correct no-load readings.

4-12. Turn the "D.C. AMMETER RANGE" switch from "START" and check the d-c ammeter and voltmeter.

4-13. Position the "D.C. AMMETER RANGE" switch and the "A.C. AMMETER RANGE" switch higher than the current flow to be encountered in the ensuing tests before imposing a load on the inverter.

4-14. To impose a load on the inverter, move the "LOAD" switch to "1 PHASE" or "3 PHASE," depending on the inverter under test.

NOTE

With the "LOAD CONTROL" knob at zero and the "A.C. AMMETER RANGE" switch at "1," the a-c ammeter will indicate approximately 0.2 amp. This is due to the autotransformer excitation current.

4-15. To increase the load, turn the autotransformer knob clockwise.

4-16. To obtain voltage and current readings of the individual circuits of a three-phase inverter, turn the "VOLTS/AMPS" switch through "A," "B," and "C," noting the readings at each point.

4-17. To obtain voltage and current readings of a single-phase inverter, turn the "VOLTS/AMPS" switch to the "N" position.

4-18. AFTER-TESTING PROCEDURE.

4-19. After completing the tests on any inverter, turn all toggle switches to their "OFF" positions, return the "D.C. AMMETER RANGE" switch to "START," and turn the "LOAD CONTROL" knob full counterclockwise.

4-20. When not in use, cover the equipment to keep it clean.

SECTION V

PERIODIC INSPECTION, MAINTENANCE, AND LUBRICATION

5-1. Scope of Maintenance

The maintenance duties assigned to the operator of the equipment are listed below together with a reference to the paragraphs covering the specific maintenance functions.

5-1.1

Daily preventive maintenance checks and services are covered in paragraph 5-2.4.

5-1.2

Weekly preventive maintenance checks and services are covered in paragraph 5-2.5.

5-1.3

Quarterly preventive maintenance checks and services are covered in paragraph 5-2.6.

5-1.4

Cleaning procedures are covered in paragraph 5-2.7.

5-1.5

Touchup painting information is covered in paragraph 5-2.10.

5-2

Preventive Maintenance. Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

5-2.1

Systematic Care. The procedures given in paragraphs 5-2.4 through 5-2.10 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

5-2.2

Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (para 5-2.4, 5-2.5 and 5-2.6) outline the functions to be performed at specific intervals. These checks and services are to maintain Army electronic equipment in a combat-ready condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the *References* column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by performing the corrective actions listed, higher category of maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

5-2.3

Preventive Maintenance Checks and Services Periods. Preventive maintenance checks and services of the equipment are required daily, weekly, and quarterly.

5-2.3.1

Paragraph 5-2.4 specifies the checks and services that must be accomplished daily (at least once each week if the equipment is maintained in a standby condition).

5-2.3.2

Paragraphs 5-2.5 and 5-2.6 specify additional checks and services that must be performed on a weekly and quarterly basis, respectively.

5–2.4. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Items to be inspected	Procedure	References
1	Completeness	Check the completeness of the equipment.	Appendix B, figure 1–1.
2	Exterior surfaces	Clean the exterior surfaces, including the front panel of the test set and meter glass. Check meter glass for cracks.	Paragraph 5–2.7.
3	Cable assemblies	Check the cable assemblies for security of connection to the test set and tightness of connectors on the cable.	Figure 1–2.
4	Controls and indicators	While making operational checks (5 below), observe that the mechanical action of each knob and switch is smooth and free from internal and external binding, and there is no excessive looseness. Check meter for sticking or bent pointer. Check indicator lamp for proper damaged lens.	None.
5	Operation	During normal operation of the test set, check meters for proper zero adjustment.	Paragraphs 4–7 thru 4–17.

5–2.5. Weekly Preventive Maintenance Checks and Services Chart

Sequence No.	Items to be inspected	Procedure	References
1	Exterior surfaces	Inspect exposed metal surfaces for rust and corrosion. Touchup paint as required.	Paragraph 5–2.10.
2	Cable assemblies	Inspect cables for cracked, chafed, or frayed insulation. Inspect connectors for damage or defects; replace or repair as necessary	None.

5–2.6. Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Items to be inspected	Procedure	Reference
1	Completeness	See that all publications are complete, serviceable, and current.	DA Pam 310–4.
2	Modifications	Check DA Pam 310-7 to determine the existence of applicable MWO's. Check the equipment to determine if MWO's have been performed. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled.	TM 38–750, DA Pam 310–7.

5–2.7. CLEANING

Inspect the exterior of the equipment. The exterior surfaces should be free of dust, dirt, grease, and fungus. Remove dust and loose dirt with a clean, soft cloth.

WARNING

The fumes of trichloroethane are toxic. Provide thorough ventilation whenever used. DO NOT use near an open flame. Thrichloroethane is not flammable, but

exposure of the fumes to an open flame converts the fumes to highly toxic, dangerous gases.

5-2.8

Remove grease, fungus, and ground-in dirt from the equipment using a cloth dampened (not wet) with trichloroethane.

CAUTION

Do not press on the meter face (glass) when cleaning; the meter may become damaged.

5-2.9

Clean the front panel, meter, and control knobs and switches; use a clean, soft cloth. If necessary, dampen the cloth with water; mild soap may be used for more effective cleaning.

5-2.10

TOUCHUP PAINTING. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare surfaces to protect them from further corrosion. Use zinc chromate primer and enamel (Federal standard 595). Refer to the applicable cleaning and refinishing practices specified in TM 9-213 and TB 746-10.

5-3. LUBRICATIONS

No lubrication is required.

5-4. ADJUSTMENTS

To adjust meters, turn the power switch to OFF. Use a small screwdriver to adjust the meter zero adjustment screws so that the meters indicate zero.

SECTION VI

TROUBLESHOOTING

6-1

The following troubleshooting chart indicates possible malfunctions of the equipment (or error in its operation) and lists their probable causes together with remedies for each.

TROUBLE	PROBABLE CAUSE	REMEDY
INVERTER WILL NOT START	"D. C. AMMETER RANGE" switch not properly positioned.	Set "D. C. AMMETER RANGE" switch on "START."
	D-C power source.	Check d-c power source.
	Defective microswitch (located in back of "D. C. AMMETER RANGE" switch).	Remove and check or replace microswitch.
	Defective 56F21A12 relay.	Check and/or replace relay.
	Defective inverter.	Trouble shoot inverter starting circuit.
	Inverter requires that "LIVE CIRCUIT" be energized.	Follow instructions detailed in paragraph 4-9.
"LIVE CIRCUIT" CANNOT BE ENERGIZED	Live circuit fuse blown and indicating light burned out.	Replace indicating light bulb and fuse.
INVERTER STOPS WHEN "D. C. AMMETER RANGE" SWITCH IS MOVED	"D. C. AMMETER RANGE" switch moved to wrong position, overloading the d-c ammeter.	Refer to NOTE following paragraph 4-7.a.
A-C AMMETER NOT INDICATING WHEN "LOAD" SWITCH IS ON	Blown a-c ammeter fuse.	Replace fuse.
WITH "D. C. POWER" SWITCH ON AND INVERTER OPERATING, GREEN INDICATING LIGHT DOES NOT GO ON	Burned out light bulb.	Replace bulb.

SECTION VII

CALIBRATION

7-1. GENERAL.

7-2. The tester, as such, is not calibrated since the meters read independently of each other, according to the switching and the outputs of the different inverters.

7-3. CHECKING METERS.

7-4. VOLTMETERS AND AMMETERS. Both voltmeters and ammeters can be checked by disconnecting the leads and checking them against like standard meters.

7-5. FREQUENCY METER. Connect a standard frequency meter to the "A.C." terminals of the reactor box (figure 7-1) or to the output terminals of an inverter. Connect the inverter into the tester and start the inverter as instructed in Section IV. Adjust inverter output to 400 cycles (as read on the standard meter) at 115 volts. Both frequency meters should read alike.

7-6. FREQUENCY METER ADJUSTMENT. If, when the standard frequency meter reads 400 cycles at 115 volts, the frequency meter on the tester panel does not indicate exactly 400 cycles, adjust it as follows:
a. Holding the adjusting screw at the top of the reactor box, loosen the jam nut securing the screw.
b. Slowly rotate the adjusting screw in either direction until both meters read exactly alike.
c. Carefully holding the adjusting screw in the adjusted position, tighten the jam nut to lock the screw.
d. Compare the meters again to be sure the adjustment is accurate.

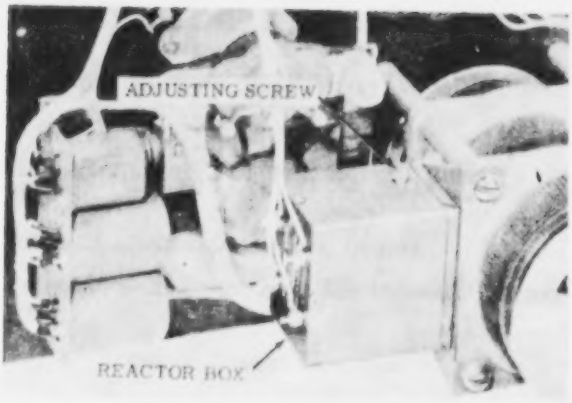


Figure 7-1. Reactor Box and Frequency Meter Adjusting Screw

7-7. REPLACING METERS.

7-8. If any meter is defective, or if it cannot be adjusted by means of the zero setting screw, remove the meter from the tester panel and replace it with one that is known to be accurate.

APPENDIX A

REFERENCES

Following is a list of applicable references available to maintenance personnel concerned with the test set:

DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins and Lubrication Orders.
DA Pam 310–7	U. S. Army Equipment Index of Modification Work Orders.
TB 746–10	Field Instructions for Painting and Preserving Electronics Command Equipment.
TB SIG 355–1	Depot Inspection Standard for Repaired Signal Equipment.
TB SIG 355–2	Depot Inspection Standard for Refinishing Repaired Signal Equipment.
TB SIG 355–3	Depot Inspection Standard for Moisture and Fungus Resistant Treatment.
TM 9–213	Painting Instructions for Field Use.
TM 11–6625–366–15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS–352B/U.
TM 11–6625–700–25	Organizational, DS, GS, and Depot Maintenance Manual: Digital Readout, Electronic counter AN/USM-207.
TM–38–750	Army Equipment Record Procedures.

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for the AN/GSM-65. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. INSPECT. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

b. TEST. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.

c. SERVICE. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

d. ADJUST. To rectify to the extent necessary to bring into proper operating range.

e. ALIGN. To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized. This does not include setting the frequency control knob of radio receivers or transmitters to the desired frequency.

f. CALIBRATE. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

g. INSTALL. To set up for use in an operational environment such as an encampment, site, or vehicle.

h. REPLACE. To replace unserviceable items with serviceable like items.

i. REPAIR. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

j. OVERHAUL. Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

k. REBUILD. The highest degree of material maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

l. SYMBOLS. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

C-3. Explanation of Format

a. Column 1, group number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, functional group. Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 3, maintenance functions. Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	Maintenance Category
C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

d. Column 4, tools and test equipment. Column 4 specifies, by code, those tools and test equipment required to perform the designated function. The numbers appearing in this column refer to specific tools and test equipment which are identified in Table I.

e. Column 5, Remarks. Self-explanatory.

C-4. Explanation of Format of Table I, Tool and Test Equipment Requirements

The column in Table I, Tool and Test Equipment Requirements are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the Maintenance Allocation Chart. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number of the specific tool or test equipment.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
I	TEST SET, MOTOR-GENERATOR AN/GSM-65	O		O										Clean exterior
					O								6	Zero adjustment on meters
			O										4	
									O	O			6	Cables, fuses, knobs, lamps
										H		H	1,2,3,5,7	
			H										1,2,3,5,7	Meters
											D		1,2,3,5,7	
IA	CABLE ASSEMBLIES								O	O			6	Clips, clamps, markers and terminal lugs
										H			2,5,7	
IB	TESTER ASSEMBLY	O		O										Check meter glass for cracks
					O								6	
			O										4	
			H										1,2,3,5,7	
									O	O			6	Boots, guard fuse, knob, and lamp
										H			1,2,3,5,7	
								H				H	1,2,3,5,7	
											D		5	

TABLE I. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL AND TEST EQUIPMENT REQUIREMENTS				
TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/GSM-65 (cont.)		
1	H,D	AMMETER ME-156/U	6625-620-1405	
2	H,D	AMMETER, PANEL	6625-089-5645	
3	H,D	COUNTER, ELECTRONIC, DIGITAL READOUT AN/USM-207	6625-911-6368	
4	O,H,D	MULTIMETER TS-352B/U	6625-242-5023	
5	H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-605-0079	
6	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-610-8177	
7	H,D	VOLTMETER, ELECTRONIC ME-202A/U	6625-709-0288	

By order of the Secretary of the Army:

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The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12–36 (qty rqr block no. 381) direct and general support maintenance requirements for all Fixed and all Rotor Wing aircraft.

☆U.S. GOVERNMENT PRINTING OFFICE: 1990 - 263-912/38399